

SUPERFUND CLOSE-OUT REPORT**WHITTAKER SITE
MINNEAPOLIS, MINNESOTA****I. INTRODUCTION**

This final Close Out Report documents that the U.S. Environmental Protection Agency (EPA) completed all construction and response activities for the Whittaker Site in accordance with Procedures for Completion and Deletion of National Priorities List Sites and Update (OSWER Directive 9320.2-09). The Whittaker Corporation hired a consultant to conduct a final investigation of the Site. Based on the results of this investigation the Minnesota Pollution Control Agency (MPCA) determined that the soils and ground water on-site and downgradient of the Whittaker Site does not pose a threat to public health and the environment.

II. SUMMARY OF SITE CONDITIONS**Background**

The Whittaker Site covers approximately 7.5 acres and is located in Hennepin County, Minnesota (5th Congressional District). The Whittaker Site is shown in Figure 1. The Whittaker Corporation acquired this Site from the American Petroleum Corporation in 1967. Whittaker operated the facility until 1980. The principal products produced at the Whittaker Site were industrial coatings and resins. Automotive product packaging was also a production activity which took place at this facility. One chemical found in storage tanks on-site was propylene glycol, commonly called - antifreeze. It is assumed this was one of the products packaged at this facility. Steel also was distributed from this facility. Chemicals were stored in approximately 28 aboveground tanks ranging in size from 2,000 to 200,000 gallons and 21 underground tanks ranging in size from 2,500 to 14,000 gallons. The tanks contained propylene glycol, styrene monomer, di-isobutyl ketone, methyl ethyl ketone, methyl isobutyl ketone, toluene, xylene, and other chemicals.

A variety of wastes were generated as a result of the processes used at the Whittaker Site. These wastes included tank bottoms, paint sludge, old paints, off-specification paints and resins, and cleaning fluids. The Site was proposed for the National Priorities List (NPL) on September 18, 1983. The Site was added to the NPL on September 21, 1984.

Remedial Planning Activities

On September 24, 1981, Minnesota Pollution Control Agency (MPCA) requested the Whittaker Corporation and Tool Tech Company to complete a Preliminary Remedial Investigation Phase I study. The Phase I report was submitted by Whittaker/Tool Tech Company to MPCA in January 1983. In response to a request from the MPCA, a ground water investigation was initiated by the Whittaker Corporation in early 1983. Monitoring wells were installed as part of that ground water investigation. Ground water samples were analyzed and found to contain benzene; tetrahydrofuran; methyl isobutyl ketone; 1,1-dichloroethane; cis and trans 1,2-dichloroethylene and chlorobenzene; xylene; 1,1,2-trichloroethylene; cadmium; and chromium. The Whittaker Corporation completed soil treatment and removal actions, and tank removal operations in 1985.

Some soil sampling was done and ten monitoring wells were installed at the Site between 1983 and 1985. Specific response actions which occurred during this period included:

- ❖ Removal of approximately 600 damaged drums and drum remnants to a permitted Resource Conservation Recovery Act (RCRA) off-site disposal facility.
- ❖ Excavation of approximately 10,000 cubic yards of visibly contaminated soil.
- ❖ Physical separation of resins from soils resulting in the shipment of 12 truck loads of hazardous waste materials to an out-of-state permitted RCRA facility.
- ❖ Off-site incineration of 25 drums of recovered solvents.
- ❖ Excavation and thermal processing of soils on-site in an aggregate dryer.
- ❖ Landfarming of dried soils on-site to volatilize organics.
- ❖ Shipment of approximately 280 cubic yards of waste material off-site to a permitted RCRA facility.
- ❖ Installation of a ground water pump and treat system using two air strippers in series.

The ground water pump and treat system began operations on May 9, 1985. The ground water clean-up standards for the pump and treat system were based on the State issued Health Risk Limits (HRLs) for xylene, ethylbenzene, toluene and benzene (See Attachemt 1).

The MPCA under state authority issued a Request for Response Action (RFRA) to the Whittaker Corporation on April 23, 1985.

In response to the work completed at the Whittaker Site, the RFRA was amended on November 26, 1985. The amended RFRA required Whittaker Corporation to perform the following actions under state authority:

1. Continue operation of the ground water pump and treat system until specified ground water clean-up levels have been reached.
2. Continue monitoring the ground water at and surrounding the Site for specific parameters listed in the amended RFRA.
3. Submit written reports concerning the data collected to MPCA.
4. Follow a contingency plan spelled out in the event the system fails to achieve the ground water clean-up levels specified.
5. Place notifications in the chain of the title for the property to notify purchasers of the existence of the amended RFRA and any resulting limitation on the use of the Whittaker Site.
6. Follow the Site Closure plan spelled out in the RFRA.

The following are major submittals and actions taken by the Whittaker Corporation and the MPCA staff pursuant to the RFRA issued to the Whittaker Corporation on April 23, 1985, and as amended on November 26, 1985.

A Remedial Investigation Final Report (RI Final Report) was submitted by the Whittaker Corporation on June 14, 1985 and approved by the MPCA on July 5, 1985. The RI Final Report reported on the physical states and amounts of contamination; the media affected by contamination; the pathways by which contamination reached the media; the extent and magnitude of contamination in the soil; the extent and magnitude of contamination in the groundwater; the impact of groundwater contamination; the location, uses, depth, conditions and pump out rates of area wells; the human and environmental exposure within a 1,000 foot radius of each identified source of contamination; the RA alternatives identified and considered to eliminate or minimize the threat of contamination from releases or threatened releases at the Site; the results of video logging of the Whittaker Corporation industrial well; and ground water pump test results.

An Interim Response Action (IRA) Report also was submitted on June 14, 1985 and approved by the MPCA on July 5, 1985. The IRA report addressed the types and amounts of contaminated material removed from the Site; provided the hazardous waste manifests and shipping papers; described the follow-up restoration performed at the Site and adjacent property; provided details of areas excavated; described backfill techniques for backfill placed on the excavation; and provided an anticipated schedule for future Response Actions at the Site.

On July 30, 1985, the Whittaker Corporation submitted the following three reports:

1. An Alternatives Report.
2. A Detailed Analysis Report, and
3. A Response Action Implementation Report.

The MPCA approved all three reports on September 4, 1985.

The Alternatives Report evaluated various RA alternatives, the effectiveness of each alternative and the feasibility of each alternative. It recommended implementation or dismissal of each alternative evaluated. The Detailed Analysis Report provided a detailed description of the recommended alternatives, an environmental assessment for each of the recommended alternatives, and a conceptual design of the recommended combination of alternatives. Finally, the Response Action Implementation Report spelled out the proposed remedy and how that remedy would be installed and operated. The MPCA approved the Response Action Implementation Report with the modification of including future monitoring of 1,1-dichloroethylene and trichloroethylene in monitoring well number 10.

As required by the amended RFRA, the Whittaker Corporation installed a groundwater pump and treat system which ran from 1985 until July 11, 1994. In July, 1994, the Whittaker Corporation - alleged the pump and treat system was pulling contaminated ground water into the system from off-site areas. Based on this assumption, Whittaker Corporation unilaterally shut the system down. It has not been operated since July 11, 1994. The RFRA also required annual ground water monitoring and submission of an annual report documenting work completed during the previous year. Whittaker Corporation has not submitted an annual monitoring report since 1995, in violation of the RFRA. As a result, the MPCA requested the Whittaker Corporation to perform additional soil and groundwater sampling.

On September 16, 1993, a Five-Year review report was conducted. The groundwater pump and treat system was found to be operational and functional and together with restricted groundwater use at the site, continued to provide adequate protection of human health and the environment.

In December 1993, Whittaker Corporation hired Delta Environmental Consultants, Inc. (Delta), a consultant, to oversee a test trenching operation. Delta dug six test trenches at the Site. Each trench was dug to the water table, a depth of approximately 15 to 17 feet below grade. Delta concluded from the analytical data collected that two areas of contaminated soils were present at the Site. One area in the middle of the Site showed low levels of xylene and ethylbenzene. The other contaminated area identified by Delta was previously owned by the Electro Static Finishing, Inc. and is currently owned by Applied Coatings Technologies, Inc.. This area of the Site was adjacent to a former underground storage tank area north of the Site.

Additional Investigation Activities

The MPCA completed an investigation of two areas immediately adjacent to the Whittaker Site in 1997, one north and one west of the Whittaker Site. MPCA's goal was to evaluate whether either of these two adjacent areas could be causing ground water to become contaminated and drawn into the Whittaker Site pump and treat system as the Whittaker Corporation alleged. MPCA did not find any evidence to support that theory.

On July 9, 1997, MPCA staff was present during excavations of soil on adjacent land west of the Whittaker Site. The field investigation performed adjacent to the Site was in response to a request from the owner of the 3K Paper Company for a determination of no further action through the MPCA Voluntary Investigation and Cleanup program. MPCA staff did not observe any substantial soil contamination during the time the trenching was being done by the 3K Paper Company consultant.

In May 1998, the Whittaker Corporation hired a consultant to investigate further the magnitude and extent of soil contamination at the Whittaker Site and to investigate the magnitude and extent of ground water contamination at and downgradient of the Whittaker Site. The field investigation found that soil and ground water contamination at and down-gradient of the Whittaker Site remains, but are at levels which no longer pose a threat to public health or the environment.

Soil Operable Unit

A soil investigation was completed in 1998, with geoprobes advanced at each of the former potential source areas defined using a historical facility map. Low concentrations of toluene, ethylbenzene, xylene, and solvent compounds were detected in soil. Residual contamination was encountered in the soils that were treated and backfilled in 1985. All results obtained in 1998 were below RFRA clean-up goals and at least one order of magnitude below the MPCA Tier 1 Soil Leach Values (See Attachment 2). The RFRA soil clean-up goals were based on MPCA Tier 1 Spoil

Leach Values. The Geoprobe investigation provided necessary confirmation sampling for the various potential source areas and provides a comprehensive remedial investigation. No impacts of concern to soils remain at the site. Therefore, the soils operable unit can be delisted and the site can be closed relative to a release in soils.

Ground Water Operable Unit

Monitoring wells were sampled between 1983 and 1994, and in May 1998 by the Whittaker Corporation consultants. The 1998 samples detected toluene, ethylbenzene and xylene in ground water at the former trench area (wells MW9, Sump3). In MW-9, xylene was the only parameter measured on the entire Site which exceeded the RFRA action levels and the Minnesota Health Department Health Risk Limit (HRL).

During the 1998 investigation, solvent related compounds 1,2 - dichloroethene, trichloroethene, 1,1-dichloroethane and trichloroethane were also detected in wells on the south side of the property and in downgradient/off-site wells, but at concentrations below the HRL. Vinyl chloride was detected off-site in MW12, and in geoprobe boring water samples, at concentrations above the HRL. In summary, impacts to ground water remain at the site and in the off-site wells.

Additional ground water monitoring and/or ground water recovery is not considered necessary based on the available data. The site is located in an industrial setting, with no receptors between the site and the Mississippi River, 0.5 miles to the west, where ground water discharges into the river. The ground water investigation demonstrated the contaminants are easily broken down by biodegradation in this setting. The property owners downgradient of the site have been contacted about residual VOC contamination in ground water beneath their site, and expressed no concerns.

Given the results of the investigation performed at the Site, the ground water at the Site does not exhibit concentrations of compounds that are considered a significant public health threat or a threat to the environment. In the absence of any other conflicting data, the ground water operable unit is also suitable for delisting or closure.

Community Relations Activities

This site is situated in an industrial area on the edge of Minneapolis. The site at one time posed a threat to the immediate surrounding community, but was never the object of public interest. MPCA staff was asked to address one local Community group in 1996. No other public meetings or were held for this site after 1996.

III. DEMONSTRATION OF QUALITY ASSURANCE/QUALITY CONTROL (QA/QC) FOR CLEAN-UP ACTIVITIES

The long-term effectiveness of the final remedy was demonstrated through the soil and ground water investigation completed in May 1998. The data gathered during this investigation confirmed that the soils and ground water on-site and downgradient of the Whittaker site do not pose a threat to public health and the environment for the present and future land-use classifications assigned to this site. The RFRA contains all the QA/QC procedures and protocol for the Site. The QA/QC program utilized throughout the response action was sufficiently rigorous and was adequately complied to enable MPCA to determine that all analytical results reported were accurate to the degree needed to ensure satisfactory execution of the response action.

IV. MONITORING RESULTS

Because the May 1998 investigation found the soils and ground water no longer pose a threat to public health or the environment, no further soil or ground water monitoring is necessary at this site. The MPCA approved the May 1998 report.

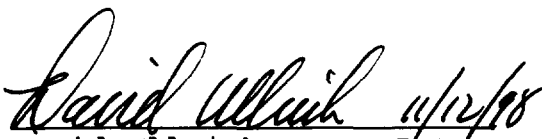
V. SUMMARY OF OPERATION AND MAINTENANCE

Long-term operation and maintenance of the Whittaker Site are also not necessary because the soils and ground water meet the cleanup standards identified in the state issued RFRA. Because no hazardous substances remain at the Site above health-based levels, a five-year review will not be conducted.

VI. PROTECTIVENESS

All the Completion requirements for this site have been met as specified in OSWER Directive 9320.2-9, Close Out Procedure for National Priorities List Sites. Specifically, confirmatory sampling verifies that the final cleanup goals for soil and ground water spelled out in the state enforced RFRA issued to the Whittaker Corporation in 1985 have been met. A table of clean-up standards for soil and groundwater, dated October 23, 1998 is listed in attachment 1. A bibliography of all reports relevant to the completion of Site remedial activities under the Superfund program, is attached. These documents are available by calling the Project Manager at the Minnesota Pollution Control Agency at (651)296-7746.

Approved By:


David Ullrich Date
Acting Regional Administrator
U.S. EPA, Region V

Disapproved By:

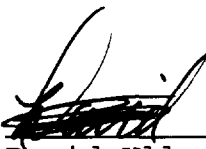
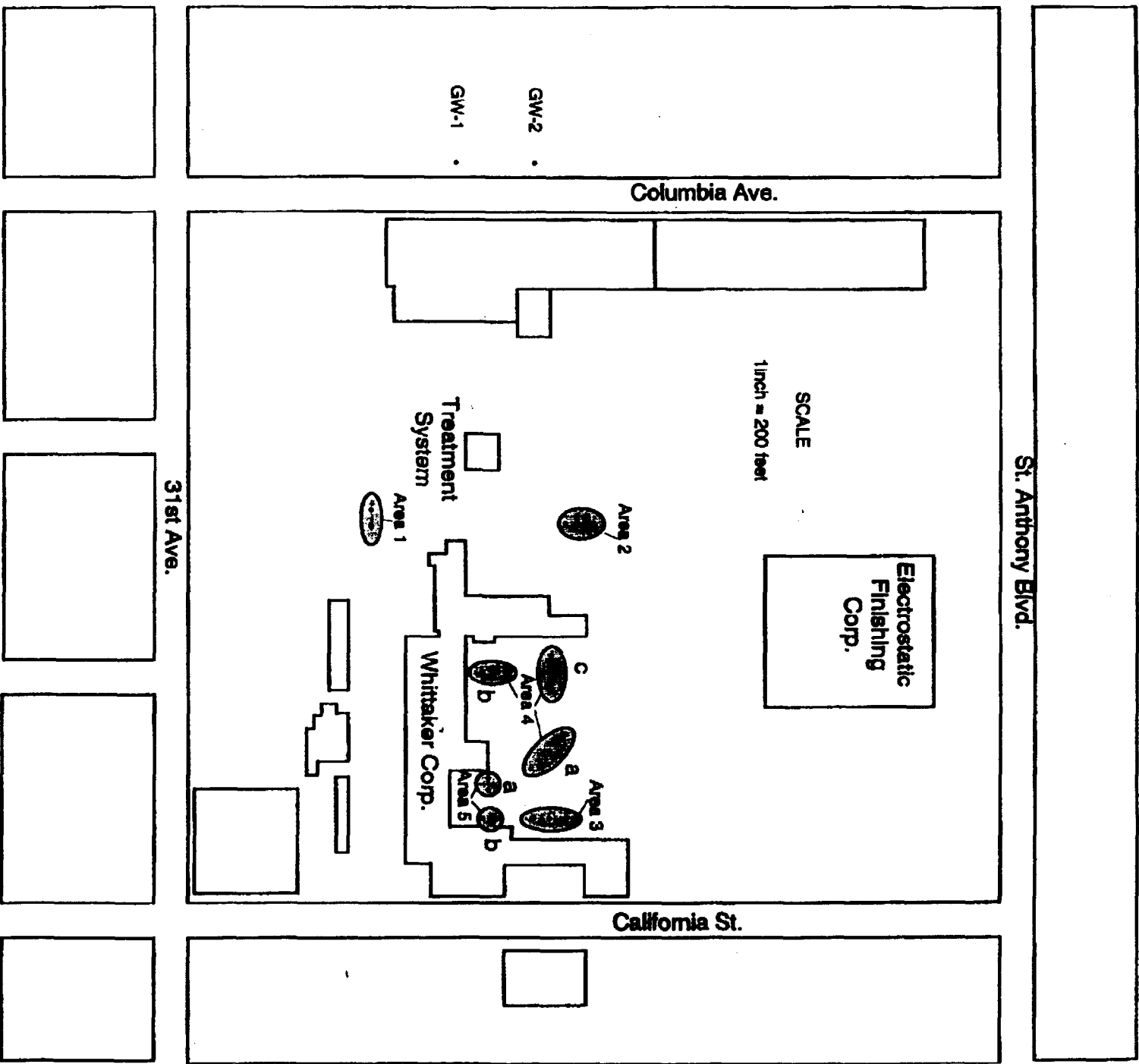

David Ullrich Date
Acting Regional Administrator
U.S. EPA Region V

Figure 1



Attachment 1

WHITTAKER CORP									
WATER QUALITY SUMMARY									
(Data included for selected wells in hot spot and downgradient areas)									
(concentration = ug/l.)									
DATE	PARAMETER	MW-3	MW-4	MW-8/RW-8	MW-9	MW-12	SUMP-3	Response Action	HRL
7/28/83	EthylBenzene	<1						1,400	700
9/19/83	EthylBenzene							1,400	700
7/12/84	EthylBenzene		<1					1,400	700
1/22/85	EthylBenzene	<1	<1					1,400	700
4/11/85	EthylBenzene	<1	<1					1,400	700
6/17/85	EthylBenzene	<1	<1	13,800		2,650	5,600	1,400	700
4/9/86	EthylBenzene					5		1,400	700
11/4/86	EthylBenzene	9	2	36		1	29,000	1,400	700
3/4/87	EthylBenzene							1,400	700
6/2/87	EthylBenzene	1	2	19		<1	36	1,400	700
3/9/88	EthylBenzene							1,400	700
6/20/88	EthylBenzene	<1	<1	1,800		<1	<50	1,400	700
6/15/89	EthylBenzene	<0.42	<0.42	14,000		<0.42	320	1,400	700
6/27/90	EthylBenzene							1,400	700
10/10/90	EthylBenzene	<0.42	<0.4	1,500		<0.42	4,000	1,400	700
8/8/91	EthylBenzene	<0.42	<0.42			<0.42		1,400	700
7/13/92	EthylBenzene		<0.33	4,300		<0.33	4,200	1,400	700
2/1/93	EthylBenzene							1,400	700
4/9/93	EthylBenzene							1,400	700
8/12/93	EthylBenzene		<0.42	4,400		<0.33	3,200	1,400	700
12/21/93	EthylBenzene							1,400	700
1/17/94	EthylBenzene							1,400	700
3/28/94	EthylBenzene							1,400	700
4/26/94	EthylBenzene							1,400	700
7/7/94	EthylBenzene							1,400	700
8/23/94	EthylBenzene		<1	6,700		<1	810	1,400	700
12/15/94	EthylBenzene		2	17,000		2	620	1,400	700
5/20/98	EthylBenzene	<1	<1	NS	6,090	<1	21	1,400	700
7/28/83	Toluene							14,300	1,000
9/19/83	Toluene							14,300	1,000
7/12/84	Toluene	<0.5	<1					14,300	1,000
1/22/85	Toluene							14,300	1,000
4/11/85	Toluene							14,300	1,000
6/17/85	Toluene	<1	<1	11,700		50	2,800	14,300	1,000
9/14/85	Toluene	7	<1	2,800		<1	3,200	14,300	1,000
4/9/86	Toluene							14,300	1,000
11/4/86	Toluene	2	<1	6,500		<1	6,900	14,300	1,000
3/4/87	Toluene							14,300	1,000
6/2/87	Toluene	<1	1	700		<1	1,300	14,300	1,000
3/9/88	Toluene							14,300	1,000
6/20/88	Toluene	<1	<1	180		<1	50	14,300	1,000

WHITTAKER CORP									
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(Data Included for selected wells in hot spot and downgradient areas)									
(concentration = ug/L)									
DATE	PARAMETER	MW-3	MW-4	MW-8/RW-8	MW-9	MW-12	SUMP-3	Response	
								Action	HRL
6/15/89	Toluene	<0.92	<0.92	2,800		<0.92	96	14,300	1,000
6/27/90	Toluene							14,300	1,000
10/10/90	Toluene	<0.92	<1.8	160		<2.2	280	14,300	1,000
8/8/91	Toluene	<0.92	<0.92			<0.92		14,300	1,000
7/13/92	Toluene		<0.5	190		<0.5	95	14,300	1,000
2/1/93	Toluene							14,300	1,000
4/9/93	Toluene							14,300	1,000
8/12/93	Toluene		<0.92	120		<0.5	140	14,300	1,000
12/21/93	Toluene							14,300	1,000
1/17/94	Toluene							14,300	1,000
3/28/94	Toluene							14,300	1,000
4/25/94	Toluene							14,300	1,000
7/7/94	Toluene							14,300	1,000
9/23/94	Toluene			170		2	<10	14,300	1,000
12/15/94	Toluene		1	170		2	1	14,300	1,000
5/20/98	Toluene	<1	<1	NS	310	<1	<1	14,300	1,000
7/26/83	Xylene							500	10,000
9/19/83	Xylene							500	10,000
7/12/84	Xylene	<1	<1					500	10,000
1/22/85	Xylene							500	10,000
4/11/85	Xylene	1	<1					500	10,000
6/17/85	Xylene		<1	54,600		10,200	20,400	500	10,000
9/14/85	Xylene	12	4	17,600		4,300	27,600	500	10,000
4/9/86	Xylene							500	10,000
11/4/86	Xylene							500	10,000
3/4/87	Xylene							500	10,000
6/2/87	Xylene	<1	<1	6,500		<1	11,000	500	10,000
3/9/88	Xylene							500	10,000
6/20/88	Xylene	<1	<1	13,000		2	6,400	500	10,000
6/15/89	Xylene	<2.2	<2.2	110,000		<2.2	9,800	500	10,000
6/27/90	Xylene							500	10,000
10/10/90	Xylene	<2.2	<4.4	5,700		<2.2	10,000	500	10,000
8/8/91	Xylene	<2.2	<2.2			<2.2		500	10,000
7/13/92	Xylene		<1.4	14,000		<1.4	13,000	500	10,000
2/1/93	Xylene							500	10,000
4/9/93	Xylene							500	10,000
8/12/93	Xylene		<2.2	15,000		<1.4	11,000	500	10,000
12/21/93	Xylene							500	10,000
1/17/94	Xylene							500	10,000
3/28/94	Xylene							500	10,000
4/25/94	Xylene							500	10,000

WHITTAKER CORP									
WATER QUALITY SUMMARY									
(Data included for selected wells in hot spot and downgradient areas)									
(concentration = ug/L)									
DATE	PARAMETER	MW-3	MW-4	MW-8/RW-8	MW-9	MW-12	SUMP-3	Response	
								Action	HRL
7/7/84	Xylene							500	10,000
9/23/84	Xylene		<1	21,000		<1	1,200	500	10,000
12/15/84	Xylene		3	34,000		6	1,300	500	10,000
5/20/88	Xylene	<1	<1	NS	14,840	<1	110	500	10,000
7/28/83	1,2 - DCE								70/100
9/19/83	1,2 - DCE								70/100
7/12/84	1,2 - DCE	<0.2	8						70/100
1/22/85	1,2 - DCE								70/100
4/11/85	1,2 - DCE	78	12						70/100
6/17/85	1,2 - DCE	9	1						70/100
9/14/85	1,2 - DCE	38	5						70/100
4/9/86	1,2 - DCE								70/100
11/4/86	1,2 - DCE		<1						70/100
3/4/87	1,2 - DCE								70/100
8/2/87	1,2 - DCE	9	17						70/100
3/9/88	1,2 - DCE								70/100
6/20/88	1,2 - DCE	16	20						70/100
6/15/89	1,2 - DCE	10	120						70/100
8/27/90	1,2 - DCE								70/100
10/10/90	1,2 - DCE	15	150						70/100
8/8/91	1,2 - DCE	3	16						70/100
7/13/92	1,2 - DCE								70/100
2/1/93	1,2 - DCE								70/100
4/9/93	1,2 - DCE								70/100
8/12/93	1,2 - DCE		100						70/100
12/21/93	1,2 - DCE								70/100
1/17/94	1,2 - DCE								70/100
3/28/94	1,2 - DCE								70/100
4/25/94	1,2 - DCE								70/100
7/7/94	1,2 - DCE								70/100
9/23/94	1,2 - DCE								70/100
12/15/94	1,2 - DCE								70/100
5/20/98	1,2 - DCE	39	10	NS	<1	1	<1		70/100
7/28/83	TCE								30
9/19/83	TCE								30
7/12/84	TCE	<0.2	34						30
1/22/85	TCE								30
4/11/85	TCE	7	80						30
6/17/85	TCE								30
9/14/85	TCE	4	61						30

WHITTAKER CORP									
WATER QUALITY SUMMARY									
(Data included for selected wells in hot spot and downgradient areas)									
(concentration = ug/L)									
DATE	PARAMETER	MW-3	MW-4	MW-8/RW-8	MW-9	MW-12	SUMP-3	Response	
								Action	HRL
4/9/86	TCE								30
11/4/86	TCE		28	<5					30
3/4/87	TCE								30
6/2/87	TCE	2	110						30
3/9/88	TCE								30
6/20/88	TCE	1	150						30
8/15/89	TCE	<0.6	63						30
8/27/90	TCE								30
10/10/90	TCE	1	6						30
8/8/91	TCE	<0.6	6						30
7/13/92	TCE								30
2/1/93	TCE								30
4/9/93	TCE								30
8/12/93	TCE		18						30
12/21/93	TCE								30
1/17/94	TCE								30
3/28/94	TCE								30
4/25/94	TCE								30
7/7/94	TCE								30
9/23/94	TCE		18						30
12/15/94	TCE		13						30
5/20/98	TCE	1	27	NS	<1	<1	<1		30

WHITTAKER CORP - 3134 CALIFORNIA STREET - MPLS.				GEOPROBE BORINGS - MAY 20 & 21, 1998						
VOLATILE ORGANIC COMPOUNDS DETECTED				SAMPLING TO CONFIRM REMAINING CONTAMINATION						
COMPARISON OF ANALYTICAL RESULTS				(soil values in ug/kg water values in ug/L)						
				Standards						
				Tier 1						
PARAMETER	SAMPLE	SAMPLE TYPE	DEPTH (feet)	FIELD OR LAB	Sample Result	MDL	PQL	SLV	HRL	
c-1,2 Dichloroethene	GW-1	water	12	field lab	11*	1			6	
trichloroethene	GW-1	water	12	field lab	3.7	1			30	
					* = value exceeds HRL					
benzene	GW-2	water	12	mdh lab	0.2	0.2			10	
c-1,2 Dichloroethene	GW-2	water	12	field lab	2.7	1			6	
c-1,2 Dichloroethene	GW-2	water	12	mdh lab	2.5	0.2			6	
t-1,2 Dichloroethene	GW-2	water	12	spectrum	1.5	0.3	1		6	
t-1,2 Dichloroethene	GW-2	water	12	mdh lab	0.2	0.2			6	
trichloroethene	GW-2	water	12	mdh lab	0.2	0.1			6	
Vinyl chloride	GW-2	water	12	spectrum	2.8*	0.2	2		0.2	
Vinyl chloride	GW-2	water	12	mdh lab	3.3*	0.2			0.2	
					* = value exceeds HRL					
Ethylbenzene	GP-1-1	soil	4-8	field lab	30	10		4,700		
Ethylbenzene	GP-1-1	soil	4-8	spectrum	620	25	1000	4,700		
Xylenes	GP-1-1	soil	4-8	field lab	240	10		45,000		
o-Xylenes	GP-1-1	soil	4-8	spectrum	710	25	1000	45,000		
m,p-Xylenes	GP-1-1	soil	4-8	spectrum	1600	25	1000	45,000		
1,3,5-Trimethylbenzene	GP-1-1	soil	4-8	field lab	18	10				
1,3,5-Trimethylbenzene	GP-1-1	soil	4-8	spectrum	130	25	1000			
1,2,4-Trimethylbenzene	GP-1-1	soil	4-8	field lab	40	10				

WHITTAKER CORP - 3134 CALIFORNIA STREET - MPLS.				GEOPROBE BORINGS - MAY 20 & 21, 1998			
VOLATILE ORGANIC COMPOUNDS DETECTED				SAMPLING TO CONFIRM REMAINING CONTAMINATION			
COMPARISON OF ANALYTICAL RESULTS				(soil values in ug/kg water values in ug/L)			
							Standards
							Tier 1
PARAMETER	SAMPLE	SAMPLE TYPE	DEPTH (feet)	FIELD OR LAB	Sample Result	MDL	PQL
1,2,4-Trimethylbenzene	GP-1-1	soil	4-8	spectrum	320	25	1000
n-Butylbenzene	GP-1-1	soil	4-8	spectrum	280	25	1000
sec-Butylbenzene	GP-1-1	soil	4-8	spectrum	75	25	1000
tert-Butylbenzene	GP-1-1	soil	4-8	spectrum	42	25	1000
Chlorobenzene	GP-1-1	soil	4-8	spectrum	98	25	1000
1,2-Dichlorobenzene	GP-1-1	soil	4-8	spectrum	31	25	1000
Isopropylbenzene	GP-1-1	soil	4-8	spectrum	44	25	1000
p-Isopropyltoluene	GP-1-1	soil	4-8	spectrum	140	25	1000
Methyl isobutyl ketone	GP-1-1	soil	4-8	spectrum	31	25	1000
Naphthalene	GP-1-1	soil	4-8	spectrum	230	25	1000
n-Propylbenzene	GP-1-1	soil	4-8	spectrum	46	25	1000
Styrene	GP-1-1	soil	4-8	spectrum	920	25	1000
Toluene	GP-1-1	soil	4-8	spectrum	630	25	1000
benzene	GP-2-1	soil	12-16	meth lab	60	20	34
Xylenes	GP-2-1	soil	12-16	field lab	550	10	45,000
o-Xylenes	GP-2-1	soil	12-16	spectrum	390	25	1000
m,p-Xylenes	GP-2-1	soil	12-16	spectrum	2200	25	1000
o-xylene	GP-2-1	soil	12-16	meth lab	5100	20	45,000
m&p xylene	GP-2-1	soil	12-16	meth lab	27000	20	45,000
Toluene	GP-2-1	soil	12-16	spectrum	78	25	1000
toluene	GP-2-1	soil	12-16	meth lab	1100	20	6,400

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COMPARISON OF ANALYTICAL RESULTS				(soil values in ug/kg water values in ug/L)					
				Standards					
				Tier 1					
PARAMETER	SAMPLE	TYPE	DEPTH	FIELD	Sample	MDL	PQL	SLV	HRL
			(feet)	OR LAB	Result				
n-butylbenzene	GP-2-1	soil	12-16	spectrum	76	25	1000		
n-butylbenzene	GP-2-1	soil	12-16	mdh lab	890	50			
sec-butylbenzene	GP-2-1	soil	12-16	mdh lab	280	50			
tert-butylbenzene	GP-2-1	soil	12-16	mdh lab	80	50			
chlorobenzene	GP-2-1	soil	12-16	mdh lab	60	20		1,100	
1,2-dichlorobenzene	GP-2-1	soil	12-16	mdh lab	140	20		7,800	
1,4-dichlorobenzene	GP-2-1	soil	12-16	mdh lab	30	20		130	
Ethylbenzene	GP-2-1	soil	12-16	spectrum	850	25	1000	4,700	
Ethylbenzene	GP-2-1	soil	12-16	mdh lab	12000	20		4,700	
Hexachlorobutadiene	GP-2-1	soil	12-16	mdh lab	60	20		25,000	
Isopropylbenzene	GP-2-1	soil	12-16	spectrum	39	25	1000	18,000	
Isopropylbenzene	GP-2-1	soil	12-16	mdh lab	720	50		18,000	
Isopropyltoluene	GP-2-1	soil	12-16	mdh lab	180	50			
methyl ethyl ketone	GP-2-1	soil	12-16	mdh lab	4100	1000		6,700	
Napthalene	GP-2-1	soil	12-16	spectrum	93	25	1000	7,500	
Napthalene	GP-2-1	soil	12-16	mdh lab	50	50		7,500	
n-propylbenzene	GP-2-1	soil	12-16	mdh lab	500	50			
Styrene	GP-2-1	soil	12-16	mdh lab	340	50		1,900	
1,2,4-Trimethylbenzene	GP-2-1	soil	12-16	spectrum	120	25	1000		
1,2,4-Trimethylbenzene	GP-2-1	soil	12-16	mdh lab	1500	50			
1,3,5-Trimethylbenzene	GP-2-1	soil	12-16	spectrum	38	25	1000		
1,3,5-Trimethylbenzene	GP-2-1	soil	12-16	mdh lab	630	50			

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COMPARISON OF ANALYTICAL RESULTS				(soil values in ug/kg water values in ug/L)					
				Standards					
				Tier 1					
PARAMETER	SAMPLE	SAMPLE TYPE	DEPTH (feet)	FIELD OR LAB	Sample Result	MDL	PQL	SLV	HRL
Benzene	GP-2-2	soil	12-16	mdh lab	70	20		34	
n-Butylbenzene	GP-2-2	soil	12-16	mdh lab	340	50			
sec-butylbenzene	GP-2-2	soil	12-16	mdh lab	130	50			
1,2-dichlorobenzene	GP-2-2	soil	12-16	mdh lab	50	20		7,800	
Ethyl benzene	GP-2-2	soil	12-16	mdh lab	1100	20		4,700	
Isopropylbenzene	GP-2-2	soil	12-16	mdh lab	160	50		18,000	
Methyl Ethyl ketone	GP-2-2	soil	12-16	mdh lab	4600	900		6,700	
Styrene	GP-2-2	soil	12-16	mdh lab	360	50		1,900	
Toluene	GP-2-2	soil	12-16	field lab	29	10		6,400	
Toluene	GP-2-2	soil	12-16	mdh lab	410	20		6,400	
1,2,4 trimethylbenzene	GP-2-2	soil	12-16	mdh lab	390	50			
1,3,5 trimethylbenzene	GP-2-2	soil	12-16	mdh lab	180	50			
Xylenes	GP-2-2	soil	12-16	field lab	340	10		45,000	
o-Xylenes	GP-2-2	soil	12-16	mdh lab	1100	20		45,000	
m&p-Xylenes	GP-2-2	soil	12-16	mdh lab	2200	20		45,000	
Tetrachloroethene	GP-3-2	soil	16-20	field lab	12	10		70	
Tetrachloroethene	GP-3-2	soil	16-20	spectrum	<25	25		70	
Benzene	GP-4A-1	soil	12-16	mdh lab	70	20		34	
Ethylbenzene	GP-4A-1	soil	12-16	mdh lab	50	20		4,700	

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COMPARISON OF ANALYTICAL RESULTS					(soil values in ug/kg water values in ug/L)				
								Standards	
		SAMPLE	DEPTH	FIELD	Sample			Tier 1	
PARAMETER	SAMPLE	TYPE	(feet)	OR LAB	Result	MDL	PQL	SLV	HRL
Methyl ethyl ketone	GP-4A-1	soil	12-16	mdh lab	4900	1000		6,700	
Toluene	GP-4A-1	soil	12-16	mdh lab	40	20		6,400	
o-Xylenes	GP-4A-1	soil	12-16	mdh lab	1100	20		45,000	
m&p-Xylenes	GP-4A-1	soil	12-16	mdh lab	2200	20		45,000	
Xylenes	GP-4-B1	soil	12-16	field lab	15	10		45,000	
o-Xylenes	GP-4-B1	soil	12-16	spectrum	54	25	1000	45,000	
o-Xylenes	GP-4-B1	soil	12-16	mdh lab	190	20	1000	45,000	
m,p-Xylenes	GP-4-B1	soil	12-16	spectrum	110	25	1000	45,000	
m,p-Xylenes	GP-4-B1	soil	12-16	mdh lab	370	20		45,000	
Toluene	GP-4B-1	soil	12-16	mdh lab	40	20		6,400	
Methyl ethyl ketone	GP-4B-1	soil	12-16	mdh lab	4600	1000		6,700	
Ethylbenzene	GP-4-B1	soil	12-16	spectrum	80	25	1000	4,700	
Ethylbenzene	GP-4-B1	soil	12-16	mdh lab	380	20		4,700	
Styrene	GP-4-B1	soil	12-16	spectrum	130	25	1000	1,900	
Styrene	GP-4-B1	soil	12-16	mdh lab	540	50		1,900	
Trichloroethene	GP-4-B1	soil	12-16	mdh lab	10	10		140	
sec-Butylbenzene	GP-4-C1	soil	12-16	field lab	15	10			
Benzene	GP-4-C2	soil	12-16	mdh lab	70	20		34	
Ethylbenzene	GP-4-C2	soil	12-16	mdh lab	20	20		4,700	

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COMPARISON OF ANALYTICAL RESULTS				(soil values in ug/kg water values in ug/L)					
								Standards	
		SAMPLE	DEPTH	FIELD	Sample			Tier 1	
PARAMETER	SAMPLE	TYPE	(feet)	OR LAB	Result	MDL	PQL	SLV	HRL
Methyl ethyl ketone	GP-4-C2	soil	12-16	mdh lab	4700	1000		6,700	
m,p-Xylenes	GP-4-C2	soil	12-16	mdh lab	60	20		45,000	
1,2,4-Trimethylbenzene	GP-4-C2	soil	12-16	field lab	60	10			
1,2,4-Trimethylbenzene	GP-4-C2	soil	12-16	spectrum	90	25	1000		
Benzene	GP-5A-1	soil	12-16	mdh lab	50	20		34	
Ethylbenzene	GP-5A-1	soil	12-16	mdh lab	30	20		4,700	
Methyl ethyl ketone	GP-5A-1	soil	12-16	mdh lab	3900	1000		6,700	
p-Isopropyltoluene	GP-5A-1	soil	14-16	spectrum	29	25	1000		
Toluene	GP-5A-1	soil	14-16	spectrum	30	25	1000	6,400	
m,p-Xylenes	GP-5A-1	soil	12-16	mdh lab	70	20		45,000	
Notes:									
field lab = Precision mobile laboratory equipped with Gas Chromatograph.									
spectrum = Spectrum Analytical Laboratories, performed confirmation analysis.									
mdh lab = Minnesota Department of Health Laboratory, performed duplicate analysis of same samples as analyzed by Spectrum.									
Tier 1 SLV = Tier 1 Soil Leach Values, Risk Based Guidance for the Soil Leaching Pathway User's Guide (Draft Guidelines) (MPCA, 1998).									
HRL = Health Risk Limits, Minnesota Rules Parts 4717.7100 to 4717.7800									

